Good Morning. Thank you for the invitation to be the keynote speaker for today. I've looked at the agenda for the next two days, and it looks to be a very good program that will be beneficial for all.
I have very few charts today. First, because we have been very busy in the past couple of months. Secondly, without a lot of charts, I can talk about anything I want. I have no fear that I can fill the allotted time, and there are several people in the audience that know I can also. Having said that…Mike Vetter says that I have the next two hours of your attention.

First, you probably want to know why they asked an acquisition person to speak. Well I don't know for sure, but I suspect it is because we have something to say about where the money goes and what the future systems look like. So let me tell you where I fit. As Deputy Director for Air Warfare in the Office of the Under Secretary for Acquisition Technology and Logistics, I have acquisition oversight of more than one third of the Major Defense Acquisition Programs in the Department – those are the systems that require Mr Wynne's review and approval to begin or proceed. My portfolio of programs includes all fixed wing aircraft (including fighter, bombers, tanker, airlift, trainers, and specialty aircraft, like Joint STARS). My office also oversees unmanned aerial vehicle, all air-launched weapons, and cruise missiles. The bulk of my systems are Air Force, Navy, and Marine Corps, with only a few Army systems. (There is a Deputy Director for Naval Warfare and one for Land Warfare also.)

Because targeting workstations and mission planning systems are relatively small in dollar value, those are generally run and approved within the Services. The communication and information systems are handled in ASD(NII) and USD(I).

America (and the world) owe much to this audience. Thanks in large part to the professional contributions of many of you, precision strike weapons have been a huge success in Operation Enduring Freedom. I know that some of you were probably involved with fast reaction efforts in the weapon and intelligence areas, to provide added capability for the warfighter.

I challenge all of you to think in broad terms, to continue to work diligently on the full sensor-to-shooter spectrum, and to help the warfighter be innovative – if you will, transformational – about integrating the various systems together. It is comfortable to carve out a niche and to say I did my part, but we know that it takes more than a smart bomb to make a smart attack. The system-of-system must enable our forces to locate the objective or target, provide responsive command and control, generate the desired effect, assess our level of success, and retain the flexibility to re-engage with precision when required.

Let's take a look at weapon evolution. I say evolution, but we still have all types in the inventory and each has their own attributes. We start with dumb bombs (dropped ballistically) and in that timeframe, the intelligence and weapons folks never spoke – didn't need to. We moved on to early man-in-the-loop weapons – still not a lot of interaction between intel folks and weapons designers, but the pilots and the intel folks were interfacing. Then came the bomb-on-coordinate weapons, and the weapon designers started to get the idea that they might need to talk to the intelligence folks. We had to move from our blinders on to

Joint Direct Attack Munition (JDAM) and Laser Guided Bombs have been the staple during this phase of the operation, but Tomahawk cruise missiles, Joint Standoff Weapons, Wind Corrected Munitions, and other precision weapons have also been used. And your contributions will become even more significant as we

look forward to the debut of newer precision weapons. But the challenges (or opportunities) will be there too. We need to keep pressing for shorter mission planning times for weapons like, Joint Air-to-Surface Standoff Missile (JASSM) and Tactical Tomahawk. And then even more challenging, are the weapons to hold moving and mobile targets at risk, like Small Diameter Bomb Increment 2.

As you develop the systems to improve and enable these precision weapons and warfighting systems, we need to continue our focus on **jointness and interoperability**. Those are words that we seem to throw around like meaningless buzz words, but the Department is committed to this. They are concerned about scarce resources and the ability to go out and fight as one team (Army, Navy, Air Force, Marine Corps, and allies). The benefits show up as lower development and procurement costs, simplified logistics support and training, increased sharing of systems and functions. However, if interoperability isn't designed in, then it is almost impossible and probably, cost prohibitive to do it later. My boss says…Joint should be the norm, and **exceptions should be rare**.

Some of the best insights on the entire precision targeting process came from last year's Defense Science Board (DSB) Summer Study. The panel assessed the full spectrum of precision engagement and made recommendations. Ron Mutzelburg will talk to you later today about these recommendations, and will highlight which ones are being reviewed in more detail by the Services for implementation – like, Common accurate target grid, improved sensing, and better connectivity.

An integral link in the precision strike process is the sensing. We must focus on knowing the battlespace. Situational awareness ensures aircraft

survivability and aircrew safety, as well as highlights enemy movement and target relocation. I think that it is important, to the extent possible, that we collaborate the information that is gathered by **every** platform. My feeling is that… all platforms (including soldiers, Marine, and Special Ops Forces) are sensors; some are also shooters. Most platforms have a multitude of sensors. If all that sensor information were "stitched together" in a correlated manner and made available to every other platform, consider how much better we might understand the battlespace.

Speaking of sensors, we've seen unprecedented use of Unmanned Aerial Vehicles (UAVs) in support of combat operations in Kosovo, and more recently in Afghanistan, to supplement our more traditional intelligence network. The deployment of UAVs in theater has enabled the warfighter to conduct important reconnaissance operations, precluding the need to send manned aircraft into hostile airspace. We've been afforded long dwell over hostile territory -- a task which would have been impossible for our manned aircraft to perform safely – especially where air defenses are a threat. UAV contributions are many and their use has provided us with valuable information for revising doctrine, strategies, and tactics for future operations. I think it is safe to say we have gained confidence in UAVs and their capabilities.

Leveraging off of this confidence and innovation from Operation Enduring Freedom, we should continue to uses UAVs to directly cue weapon systems – tactical aircraft, AC-130 gunships, Multiple Launch Rocket Systems – to quickly prosecute emerging targets. We need to pursue avenues for ensuring better sensor capability and better targeting, so that militarily useful information can be passed directly to the shooter. UAVs are clearly a transformational system, and the innovative ways in which we use them – such as weaponized UAVs – will continue to afford us opportunities.

In operations and in continuing exercises that attempt to demonstrate end-to-end precision strike operations, we find significant delays in the processing of information. As we begin to solve the tough problems of surveillance, detection, and target location, we must solve both technical and management hurdles. ASD(C3I) John Stenbit will speak later today, giving his vision on the linkages for near-instantaneous information about the battlefield. We must also help by structuring experiments to test and exercise the human decision process to make it timely and effective.

There are parts of the precision targeting process that are ripe for improvement. For example, where in-flight retargeting is necessary, the transfer of target coordinates is often done by voice transmission via radio and entered by hand on the strike platform. By its nature, this is a very deliberate process, which can be lengthy and has significant room for error. (That is probably why this is called "fat-fingering" in coordinates.) If we can move to an automatic transfer of coordinates – "machine-to-machine" like General Jumper has called for -- the human error can be eliminated from the process. This takes common coordinate systems, and common formats – increased interoperability.

While our weapons do very well against fixed targets, the targeting and evaluation of mobile targets have been more problematic. Tracking, locating, and prosecuting mobile ground forces require a quick, adaptive targeting process. Some exciting work is being done within the Services and Defense Agencies, and we need to continue our attention and effort in this area.

I thank you again for this opportunity to speak, and I thank all of you for your contributions in this area of defense. I challenge you to remain innovative in your efforts to reach new heights in precision targeting capability and the

implementation on behalf of the warfighter. It is indeed the integration of precision effects that will most significantly contribute to our ability to defend our Nation and our allies.